PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference FNTYA023WO	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/JP2004/010276	International filing date *(day/month/year)* 13.07.2004	Priority date *(day/month/year)* 30.07.2003
International Patent Classification (IPC) or national classification and IPC B60L11/18, B60K6/04, H02J7/14		
Applicant TOYOTA JIDOSHA KABUSHIKI KAISHA et al.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 7 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☐ *sent to the applicant and to the International Bureau)* a total of sheets, as follows:
      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the opinion
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
20.05.2005	19.09.2005
Name and mailing address of the international preliminary examining authority: European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Bufacchi, B Telephone No. +31 70 340-3429

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/JP2004/010276

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
   - ☐ international search (under Rules 12.3 and 23.1(b))
   - ☐ publication of the international application (under Rule 12.4)
   - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages	
1-43	as originally filed
Claims, Numbers	
1-23	as originally filed
Drawings, Sheets	
1/10-10/10	as originally filed

   ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

* *If item 4 applies, some or all of these sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/JP2004/010276

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-23
	No:	Claims	
Inventive step (IS)	Yes:	Claims	2-5, 7-10, 15, 17, 18, 22-23
	No:	Claims	1,6,11-14,16,19-21
Industrial applicability (IA)	Yes:	Claims	1-23
	No:	Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 The following documents are referred to in this communication:

D1 : EP-A-1 318 285 (TOYOTA MOTOR CO LTD) 11 June 2003
D2 : EP 0 829 386 A (TOYOTA MOTOR CO LTD) 18 March 1998
D3 : US 2002/094908 A1 (HARADA CHIAKI ET AL) 18 July 2002
D4 : EP 0 909 675 A (TOYOTA MOTOR CO LTD) 21 April 1999
D5 : EP 1 245 422 A (VISTEON GLOBAL TECH INC) 2 October 2002

2. **The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1, 14 and 21 is not inventive in the sense of Article 33(3) PCT.**

Claims 14 contains all the features of claim 1 (it covers an automobile including the apparatus of claim 1) and is therefore a dependent claim. Claim 21 lists only the method steps also included in claim 1. The reasoning below therefore holds for all these claims.

Document D4 discloses (the references in parenthesis applying to this document):

A power output apparatus that outputs power to a drive shaft, said power output apparatus comprising;

a) an internal combustion engine;
b) an electric power-mechanical power input-output unit that is linked with an output shaft of said internal combustion engine and with the drive shaft to maintain or vary a driving state of said internal combustion engine and to output at least part of power from said internal combustion engine to the drive shaft through inputs and outputs of electric power and mechanical power (Fig. 1);
c) a motor (26, 28) that is capable of inputting and outputting power from and to the drive shaft;
d) a secondary battery (50) that is capable of supplying and receiving electric power to

and from said electric power-mechanical power input-output unit and said motor;

e) an input restriction setting module that sets an input restriction of said secondary battery (claim 1);

f) a charge-discharge electric power measurement module that measures a charge-discharge electric power used to charge said secondary battery or obtained by discharging said secondary battery (claim 3; Figs 3-5);

g) a power demand setting module that sets a power demand required to the drive shaft, in response to an operator's manipulation (44);

h) **a driving state varying mode changeover module that selects a driving state varying mode to vary the driving state of said internal combustion engine (col. 6, lines 1-6),** based on the charge-discharge electric power measured by said charge-discharge electric power measurement module and the input restriction set by said input restriction setting module (Para. 0018, 0019).

[Note: D4 clearly discloses that the variation of the driving state of the internal combustion engine (col. 6, lines 1-6) is based on the measured "charge-discharge electric power" (col.6, line 23-25). Since the "input restriction" of the secondary battery (see claims 1 and 3) determines the charging current generated by the generators, which are driven by the engine, this will affect the engine driving state too. So, since the engine driving state varies according to both the "charge-discharge electric power" and the "input restriction", no difference can be seen between the disclosure of D4, and this feature of claim 1].

i) a controller that controls said internal combustion engine (10), said electric power-mechanical power input-output unit and said motor to ensure a variation in driving state of said internal combustion engine in the selected driving state varying mode and output of a power corresponding to the setting of the power demand to the drive shaft (para 0018, 0019).

The subject-matter of claims 1, 14 and 21 differs from this known apparatus and method only by the inclusion of feature "I" below:

I the driving state varying mode changeover module selects a driving state varying mode to vary the driving state of said internal combustion engine **in response to setting of an abruptly decreasing power demand** by said power demand setting

module.

The problem to be solved by the present invention may therefore be regarded as providing safe and effective charging of a secondary battery when the power demand is abruptly decreased.

D4 discusses the general problem with which the application is concerned, namely that the battery needs to be charged and discharged according to certain limitations under all driving conditions, including decreasing power demand or braking. While teaching that overcharging must be avoided, it does not disclose the more specific problem of limiting overcharging in response to abruptly decreasing power demand.

This problem is, however, well known to a person skilled in the art. See for example D1, Para 0077 (which discloses both the problem and claimed solution); D2, claim 22 and D3, para. 0105.

Document D5 discloses the solution embodied in feature "I" of claims 1, 14 and 21, namely that the driving state varying mode changeover module selects a driving state varying mode to vary the driving state of said internal combustion engine **in response to setting of an abruptly decreasing power demand** by said power demand setting module - see eg. D5, claims 23-26. See also D1, para 0077.

Since both the problem and claimed solution are known, the subject matter of these claims is obvious in the light of D4 combined with D5 or D1, as well as in the light of D1, D2 or D3, each taken individually.

[Note: Since no special technical effect resulting from the combination of features listed above is apparent (eg. features h) and "I" appear independent of each other, and no special technical effect appears to result from their combination), no inventive step can be associated with the combination of feature "I" with any of features a) to i) above].

3. **Dependent claims 6, 11-13, 16, 19, 20 do not contain any features which, in**

combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT).
These features are all disclosed or suggested by the available prior art.

4. **The combination of the features of dependent claims 2-5, 7-10, 15, 17, 18, 22-23 are neither known from nor rendered obvious by the available prior art, since it does not suggest the special engine control steps embodied in these claims.**

Re Item VII

Certain defects in the international application

Claim 14 comprises all the features of claim 1 and is therefore not appropriately formulated as a claim dependent on the latter (Rule 6.4 PCT).

The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).